CLAIMS

What is claimed is

1. A method for use in encoding video data, the method comprising:

within a sequence of video pictures, selecting a current video picture to be encoded;

dividing the current video picture into portions and selecting a current portion to be encoded;

establishing at least a first reference picture for said current portion; and

selectively assigning at least one motion vector predictor (MVP) to said current portion, said MVP including data associated with at least said first reference picture and with at least one other encoded portion of said current video picture, and wherein said MVP is not based on a temporal interpolation of motion vectors used for encoding said first reference picture.

2. The method as recited in Claim 1, further comprising:

establishing at least a second reference picture for said current portion; and

wherein said MVP further includes data associated with said second reference picture, and said MVP is not based on a temporal interpolation of motion vectors used for encoding said second reference picture.

3. The method as recited in Claim 1, wherein said first reference picture either temporally precedes or temporally follows said current video picture in said sequence of video pictures.

4. The method as recited in Claim 2, wherein said second reference picture either temporally precedes or temporally follows said current video picture in said sequence of video pictures.

5. The method as recited in Claim 2, wherein said first and second reference picture both either temporally precede or temporally follow said current video picture in said sequence of video pictures.

6. The method as recited in Claim 2, wherein said first reference picture either temporally precedes or temporally follows said second reference picture in said sequence of video pictures.

7. The method as recited in Claim 2, wherein said second reference picture either temporally precedes or temporally follows said first reference picture in said sequence of video pictures.

8. The method as recited in Claim 1, wherein said sequence of video pictures includes interlaced pictures.

9. The method as recited in Claim 1, wherein said at least one other encoded portion of said current video picture is a spatially neighboring portion within said current video picture.

10. The method as recited in Claim 2, wherein selectively assigning said MVP to said current portion further includes:

selectively assigning at least one motion parameter to said current portion, said motion parameter based on spatial prediction using at least one collocated portion within at least one of said first and second reference pictures.

11. The method as recited in Claim 10, wherein said collocated portion is intra coded.

12. The method as recited in Claim 10, wherein said collocated portion is encoded based on a different reference picture than said corresponding portion.

13. The method as recited in Claim 10, wherein said MVP is based on at least one motion parameter of at least one portion adjacent to said current portion within said current video picture.

14. The method as recited in Claim 10, wherein said MVP is used without alteration to form said motion parameter of at least one sample in a corresponding current video frame.

15. The method as recited in Claim 10, wherein said MVP is used without alteration to form said motion parameter of at least one sample in a corresponding current video field.

16. The method as recited in Claim 10, wherein said MVP is used as a prediction to which is added a coded motion vector difference to form said motion parameter of at least one sample in a corresponding current video frame.

17. The method as recited in Claim 10, wherein said MVP is used as a prediction to which is added a coded motion vector difference to form said motion parameter of at least one sample in a corresponding current video field.

18. The method as recited in Claim 13, wherein said motion parameter includes a motion vector set to zero when said collocated portion is substantially temporally stationary.

19. The method as recited in Claim 18, wherein a size of said collocated portion is one unit of motion vector value.

20. The method as recited in Claim 19, wherein said one unit of motion vector value is one quarter-sample unit in as used in encoding said reference picture of said collocated portion.

21. The method as recited in Claim 1, further comprising:

encoding said current portion using a Direct Mode scheme resulting in a Direct Mode coded current portion;

encoding said current portion using a Skip Mode scheme resulting in a Skip Mode coded current portion; and

selecting between said Direct Mode coded current picture and said Skip Mode coded current picture.

22. The method as recited in Claim 1, wherein selectively assigning said MVP to said current portion further includes:

encoding said current portion using a Copy Mode scheme based on a spatial prediction technique to produce a Copy Mode coded current portion;

encoding said current portion using a Direct Mode scheme based on a temporal prediction technique to produce a Direct Mode coded current portion; and

selecting between said Copy Mode coded current portion and said Direct Mode coded current portion.

23. The method as recited in Claim 22, wherein selecting between said Copy Mode coded current portion and said Direct Mode coded current portion is accomplished using a Rate Distortion Optimization (RDO) technique.

24. The method as recited in Claim 23, wherein said RDO technique uses a Lagrangian parameter λ based on a quantizer (QP) associated with said current portion, and wherein said RDO technique employs an adaptive weighting function.

25. The method as recited in Claim 24, wherein said adaptive weighting function includes:

$$f(QP) = \max\left(2, \min(4, \frac{QP}{6})\right).$$

26. The method as recited in Claim 23, wherein selecting between said Copy Mode coded current portion and said Direct Mode coded current portion is accomplished at least in-part based on user input.

27. The method as recited in Claim 10, wherein said MVP is based on linear prediction.

28. The method as recited in Claim 10, wherein said MVP is based on non-linear prediction.

29. The method as recited in Claim 10, wherein said MVP is based on median prediction.

30. The method as recited in Claim 10, wherein said motion parameter includes a Direct Mode motion parameter.

31. The method as recited in Claim 1, wherein said current portion is selected from a group of different types of portions comprising a picture, a block, a macroblock, a subblock, a sub-partition, a slice.

32. The method as recited in Claim 1, wherein said current picture is encoded as at least one picture selected from a group of pictures comprising a B picture and a P picture.

33. The method as recited in Claim 2, wherein said first and second reference pictures are each encoded as P pictures or B pictures.

34. The method as recited in Claim 1, wherein a syntax associated with said current picture identifies that said current picture was encoded using said MVP.

35. The method as recited in Claim 1, wherein a syntax associated with said current picture includes at least one parameter selected from a group of parameters comprising a copy_mv_spatial parameter, a direct_mv_spatial parameter, and a direct_mv_scale_div_diff.

36. The method as recited in Claim 34, wherein said syntax includes a header selected from among a group of headers comprising a frame header, a macroblock header and a slice header.

37. The method as recited in Claim 36, wherein said syntax includes at least one flag indicative of a type of direct mode encoding used.

38. The method as recited in Claim 36, wherein said type of direct mode encoding used is selected from a group comprising temporal direct mode and spatial direct mode.

39. A computer-readable medium having computer-implementable instructions for causing at least one processing unit to perform acts comprising:

encoding video data by, within a sequence of video pictures, selecting a current video picture to be encoded, dividing the current video picture into portions and selecting a current portion to be encoded, and establishing at least a first reference picture for said current portion; and

outputting at least one motion vector predictor (MVP) for said current portion, said MVP including data associated with at least said first reference picture and with at least one other encoded portion of said current video picture, and wherein said MVP is not based on a temporal interpolation of motion vectors used for encoding said first reference picture.

40. An apparatus for use in encoding video data, the apparatus comprising:

logic operatively configured to select a current video picture to be encoded from a sequence of video pictures, divide the current video picture into a plurality of portions, select a current portion to be encoded, select at least a first reference picture from within said sequence of video pictures for said current portion, and determine at least one motion vector predictor (MVP) for said current portion,

wherein said MVP includes data associated with at least said first reference picture and with at least one other encoded portion of said current video picture, and wherein said MVP is not based on a temporal interpolation of motion vectors used for encoding said first reference picture.

41. A method comprising:

decoding at least one encoded current portion of a current video within a sequence of video pictures based on at least one motion vector predictor (MVP) associated with said current portion, said MVP comprising data associated with at least a first reference picture within said sequence of video pictures and also with at least one other encoded portion of said current video picture, and

wherein said MVP is not based on a temporal interpolation of motion vectors used for encoding said first reference picture.

42. The method as recited in Claim 41, wherein said at least one MVP is further associated with at least a second reference picture within said sequence of video pictures, and

wherein said MVP is not based on a temporal interpolation of motion vectors used for encoding said second reference picture.

43. The method as recited in Claim 41, wherein said first reference picture, said second reference picture and said current video picture are arbitrarily temporally arranged within said sequence of video.

44. The method as recited in Claim 41, wherein said at least one other encoded portion of said current video picture is a spatially neighboring portion within said current video picture.

45. The method as recited in Claim 42, wherein said at least one MVP includes at least one motion parameter to said current portion, said motion parameter based on spatial prediction using at least one collocated portion within at least one of said first and second reference pictures.

46. The method as recited in Claim 45, wherein said collocated portion is intra coded.

47. The method as recited in Claim 45, wherein said collocated portion is encoded based on a different reference picture than said corresponding portion.

48. The method as recited in Claim 45, wherein said at least one MVP is based on at least one motion parameter of at least one portion adjacent to said current portion within said current video picture.

49. The method as recited in Claim 45, wherein said MVP is used without alteration to form a prediction for at least one sample in a corresponding current video frame or a corresponding current video field.

50. The method as recited in Claim 45, wherein said MVP is used as a prediction to which is added a coded motion vector difference to form said prediction for at least one sample in a corresponding current video frame or a corresponding current video field.

51. The method as recited in Claim 48, wherein said motion parameter includes a motion vector set to zero when said collocated portion is substantially temporally stationary.

52. The method as recited in Claim 51, wherein a size of said collocated portion is one unit of motion vector value.

53. The method as recited in Claim 52, wherein said one unit of motion vector value is one quarter-sample unit in as used in encoding said reference picture of said collocated portion.

54. The method as recited in Claim 45, wherein said motion parameter includes a Direct Mode motion parameter.

55. The method as recited in Claim 41, wherein said current picture is encoded as at least one picture selected from a group of pictures comprising a B picture and a P picture.

56. The method as recited in Claim 42, wherein said first and second reference pictures are each encoded as P pictures.

57. The method as recited in Claim 41, further comprising accessing a syntax associated with said current picture, wherein said syntax identifies that said current picture was encoded using said MVP.

58. The method as recited in Claim 41, wherein a syntax associated with said current picture includes at least one parameter selected from a group of parameters comprising a copy_mv_spatial parameter, a direct_mv_spatial parameter, and a direct_mv_scale_div_diff.

59. The method as recited in Claim 57, wherein said syntax includes a header selected from among a group of headers comprising a frame header, a macroblock header and a slice header.

60. The method as recited in Claim 59, wherein said syntax includes at least one flag indicative of a type of direct mode encoding used.

61. The method as recited in Claim 59, wherein said type of direct mode encoding used is selected from a group comprising temporal direct mode and spatial direct mode.

62. A computer-readable medium having computer-implementable instructions for causing at least one processing unit to perform acts comprising:

decoding at least one encoded current portion of a current video within a sequence of video pictures based on at least one motion vector predictor (MVP) associated with said current portion, said MVP comprising data associated with at least a first reference picture within said sequence of video pictures and also with at least one other encoded portion of said current video picture, and

wherein said MVP is not based on a temporal interpolation of motion vectors used for encoding said first reference picture.

63. An apparatus for use in decoding video data, the apparatus comprising:

logic operatively configured to decode at least one encoded current portion of a current video within a sequence of video pictures based on at least one motion vector predictor (MVP) associated with said current portion, said MVP comprising data associated with at least a first reference picture within said sequence of video pictures and also with at least one other encoded portion of said current video picture, and wherein said MVP is not based on a temporal interpolation of motion vectors used for encoding said first reference picture.

64. A computer-readable medium comprising:

a propagated signal carrying encoded video data that includes at least one encoded current portion of a current video within a sequence of video pictures that is encoded based on at least one motion vector predictor (MVP) associated with said current portion, said MVP comprising data associated with at least a first reference picture within said sequence of video pictures and also with at least one other encoded portion of said current video picture, and wherein said MVP is not based on a temporal interpolation of motion vectors used for encoding said first reference picture.